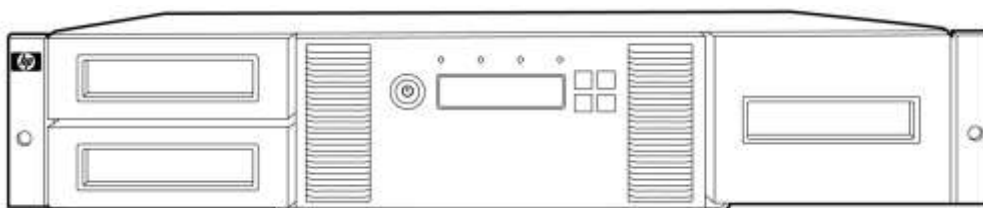


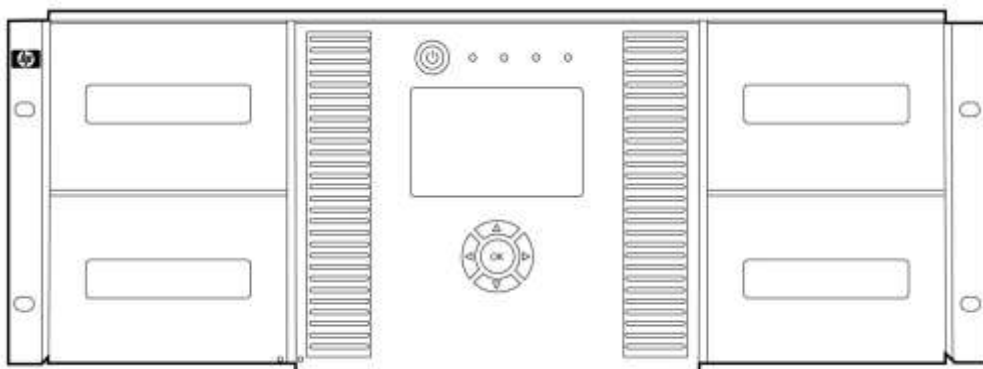
Overview

HP StoreEver MSL2024 and MSL4048 Tape Libraries

The HP StoreEver MSL Tape Libraries meet demanding storage requirement of businesses needing unattended backup, disaster recovery, or archive capability. The MSL Libraries offer a broad choice of storage capacity and technology including LTO-6, LTO-5, or LTO-4, Ultrium tape drives. Web-based remote management makes the MSL Libraries easily managed from across the room or across the globe, eliminating the need for remote office IT staff. Quickly and simply manage the tape media both in and out of the library with the standard bar code reader, configurable mail slots, and multiple 12-slot removable magazines. If a tape were lost or stolen, protect important business data from unauthorized access with data encryption options. MSL library investment protection and uncertain data growth are easily managed within the MSL library portfolio. Quickly increase capacity and/or performance with tool-free drive upgrades in the MSL2024 or 4048, or move tape drive kits to the MSL6480 for library scalability and additional enterprise class features. Proactively receive detailed information about your MSL libraries with TapeAssure. Information about the library, drives, and media are all monitored for utilization, operational performance, and life and health information. Prevent problems before they occur by proactively receiving notification if any library, drive or tape media parameters fall below HP recommended standards.



HP StoreEver MSL2024 Tape Library



HP StoreEver MSL4048 Tape Library

Key Features

- Exceptional storage density from 4.8 TB (2024) to 300 TB in an MSL4048, up to 3.5 PB of compressed capacity (2.5:1) with an MSL6480.
- Easy-to-use web-based remote management
- Integrated bar code reader
- Tool-free tape drive upgrades
- Leverage tape drives in an MSL2024 or 4048 into an MSL6480 for investment protection.
- Customer upgradeable redundant power supply in the MSL 4048.
- Multiple interface choices available (FC or SAS)
- Removable magazines with user-configurable mail slots

Overview

- Easy-to-enable AES 256-bit embedded hardware encryption with compression
 - Extensive OS and software compatibility testing
 - Proven high reliability
 - Achieve the highest level of encryption security to secure confidential business information while meeting compliance guidelines with the HP 1/8 G2 & MSL Encryption Kit or KMIP 1.2 Encryption Key Manager License.
 - Proactively monitor utilization, operational performance, and overall life and health of the drives and media with TapeAssure and TapeAssure Advanced.
 - Quick, easy, and affordable capacity growth.
-

Product Highlights

Manageability

The MSL Tape Libraries come with web-based remote manageability so they can be easily monitored and managed from across the room or across the globe. Functions included in the management tool include:

- Status information on the drive and system
- System configuration operations and reporting
- System error and status logs
- Library and drive firmware upgrade capabilities
- Diagnostic tests and information
- Cartridge movement for maintenance and management purposes
- Cleaning cartridge support
- Security and access control
- SNMP support for IP communication
- Partitioning and Encryption management
- HTTPS capable
- IPv6 and IPv4 network protocol support

TapeAssure

HP TapeAssure makes managing, optimizing and archiving on the HP StoreEver MSL Tape libraries easier. TapeAssure provides comprehensive summaries and detailed information about the status, performance, utilization, and health of all tape drives and cartridges. TapeAssure utilization and performance reporting features allow you to optimize the use of your existing HP MSL tape libraries to make informed purchasing decisions if an increase in capacity is needed.

- Modify backup schedules to make best use of the drives and tapes available and evenly distribute their workload
- Predict and prevent failures through early warnings and recommended service actions
- Determine if each drive and each tape is experiencing a high (or low) rate of usage
- Know when to retire tapes
- Find out the compression ratios actually achieved

TapeAssure builds a database of drive and tape history information that you can export as .CSV (comma-separated-value) files and import into Excel or other tools to create pivot-charts, pie charts and bar charts for graphical presentation or further analysis. This data can be automatically exported on a schedule or on demand and written to a local or network drive where analysis scripts can also be run.

TapeAssure real time alerts notify instantly if drive and data quality standards are not being achieved:

- In-depth analysis pinpoints if drive, tape or data characteristics fall below HP backup and archiving standards
- View alerts and statistics is real-time in the Command View TL GUI

TapeAssure Advanced

HP StoreEver TapeAssure Advanced Software is a licensed feature that leverages the information from TapeAssure but will additionally provide an intuitive, easy to use dashboard, and advance analytics feature for performance, health and utilization related to tape libraries, drives and cartridges.

Product Highlights

Advanced analytics feature makes use of predictive analytics to predict the likelihood of failures, bottlenecks and load balancing issues in the tape infrastructure. It has unique capabilities of analytics around drive health and life as well as cartridge health and life.

TapeAssure Advanced is well integrated into HP Command View TL Software for a single pane of glass management, monitoring and analytics. HP TapeAssure Advanced Software provides a dashboard display with pie charts, live and historical graphs for performance, health and utilization data, and highlights issues in the tape infrastructure.

NOTE: CommandView TL is a required pre-requisite for TapeAssure Advanced.

Easy Installation

The MSL Tape Libraries are shipped as a rack-ready unit. The rack mount hardware included with the library allows installation in a variety of HP racks. For more information on the HP rack offerings, please see the following URL:
<http://www.hp.com/go/rackandpower>

Partitioning

The MSL Tape Libraries now include the ability to be configured as a partitioned library. Most MSL Libraries may be configured with up to one partition per drive; four partitions if four drives are installed. Partitioning allows each partitioned library to be presented to the host as an independent library, separate from other partitions in the library. Hosts for each partition own independent sets of media and can use ISV software that is different from the other partitions allowing maximum flexibility and utilization of the MSL library.

Proven Reliability

With a rating of 2,000,000 robot load/unload cycles, the MSL Tape Libraries provides necessary high reliability for today's demanding environment. To improve reliability and longevity, all HP Ultrium products feature Data Rate Matching (DRM). This allows the tape drive to dynamically and continuously adjust the speed of the drive, to match the speed of the host or network. This increases performance, reduces mechanical wear on the tape drive and extends tape life.

Disaster Recovery and Security

Removable media also has the advantage that data is held 'offline' which means that archive data on tape has the additional level of protection from the threats to on-line data from viruses, hackers and cyber-attacks. LTO-6 Ultrium tape drives include hardware based data encryption to prevent unauthorized access to data at rest and cartridges are available with write-once-read-many (WORM) capability to prevent accidental overwriting of data archived on the tape. Both WORM and hardware data encryption features help organizations to comply with increased data security regulations

Data Encryption

The HP 1/8 G2 & MSL Encryption Kit provides a library-enabled encryption solution providing data privacy, confidentiality, and integrity of your critical business data while supporting compliance requirements. The HP 1/8 G2 & MSL Encryption Kit is an easy and affordable library-enabled encryption solution for small businesses.

Protect the confidentiality and integrity of your data:

The encryption kit includes two USB key server tokens, product documentation, and firmware support. One encryption kit is needed per library or autoloader. One USB key server token is installed in the USB port of the library to enable encryption. The token must remain in the tape library or tape autoloader while encryption is enabled. The USB key server token generates and stores keys for the LTO-6, LTO-5 or LTO-4 Ultrium drives. The USB key server token uses a hardware random number

Product Highlights

generator, a cryptographic module running on FIPS 140-2 Level 3 validated hardware, password authentication, and digital envelopes for strong encryption keys and security operations. A second USB key server token is provided in the kit to be used as a backup token which can be stored in a secure location. The keys are transferred securely token-to-token for backup or export, with no exposure to insecure PCs, servers, or networks. An option is also provided to save the token contents to a secure file. You may now also save the most recently added keys on the token to a file to enable you to seed new tokens with keys from other tokens. The encryption kit provides a self-contained solution for MSL libraries with no additional software, PCs, or servers required or involved.

Protect IT resources and meet compliance requirements:

With the HP 1/8 G2 & MSL Encryption Kit, users can enable or disable encryption, configure and manage the USB key server tokens, restore encrypted data, as well as a variety of other tasks. In addition, the LTO-6, LTO-5 and LTO-4 Ultrium tape drives use the Advanced Encryption Standard (AES) with the longest and most secure keys -- 256 bits. AES-256 encryption is implemented using the Galois Counter Mode (GCM). This method adds Message Authentication Codes to ensure the integrity as well as privacy of the backup data stored on tape. The HPLTO-6, LTO-5 and LTO-4 Ultrium Tape Drives are designed to be compliant with the standard for tape media security (IEEE 1619.1).

Protect critical business data across an enterprise:

To meet requirements for larger scale encryption key managers, the MSL family of libraries also supports KMIP 1.2 compliant key managers. With the purchase of the MSL KMIP Encryption License, the MSL library will be able to request encryption keys from KMIP 1.2 compliant key managers, for data encryption and key management.

For more information on servers supported, please visit: <http://www.hp.com/go/BURCompatibility>

Library Extender

Leverage the investment in your MSL Library, now or in the future, to increase both capacity and performance as data needs change. The HP MSL Library Extender Kit can be used to connect two MSL libraries to create one larger, logical library. The stacked libraries appear to the host as a single library. The Extender Kit can be used with MSL2024, 4048, or 8096 libraries and is compatible with both new and currently installed libraries. The Extender Kit is customer installable in under 60 minutes.

The Library Extender occupies the lowest half-height drive bay in the top library and the upper half-height drive bay of the lower library. No additional external power or communication cabling is necessary. The upper Library (MSL4048 or MSL8096) controls the extended library. Any drive in the extended library may host the library interface. Only the operator control panel (OCP), USB port, and Ethernet connection of the upper library are used in the extended mode.

The Library Extender Kit does not support combining two MSL2024 or two MSL8096 libraries. The Extended Library will not support partitioning.

Possible configurations include:

Extended Library Configurations		Slot Numbers (without mail slots enabled)	
Lower Library	Master Library	Lower Library	Master Library
MSL2024	MSL4048	1-24	25-72
MSL4048	MSL4048	1-48	49-96

Product Highlights

MSL2024	MSL8096*	1-24	25-120
MSL4048	MSL8096*	1-48	49-144

*In configurations with an 8U library, the 8U must always be the top library

NOTE: An MSL8048 must have all 96 slots enabled before using the Library Extender. Once all 96 slots are usable, configurations are the same as the MSL8096.

Serviceability

Modular in design, the MSL Tape Libraries has easily replaceable components minimizing the Mean-Time-to-Repair on the unit. Replaceable components include the tape drive, the magazines, the power supply and the controller board. HP Library and Tape Tools (L&TT) provides easy access to the MSL error log, generates support tickets, and enables firmware downloads. L&TT can be downloaded for free at: <http://www.hp.com/support/tapetools>.

LTO Ultrium Technology

HP LTO (Linear Tape Open) Ultrium Tape Drives use best of breed technology. By taking the best features from other tape technologies and combining them into a single new technology, Ultrium tape drives are in a league of their own. Inclusion of innovative features such as Adaptive Tape Speed (ATS) ensure that Ultrium drives can meet the performance and reliability demands of a library environment. LTO technology is an open industry standard format; thus data written on HP Ultrium Tape Drives can be interchanged directly with Ultrium Tape Drives from other vendors.

HP LTO tape drives and automation products are founded on the LTO open standard and adhere to the published LTO format roadmap to generation 8 at 32TB of compressed capacity per cartridge by Generation 8. With in-built two generation backwards compatibility, LTO customers can be assured of investment protection.

Data Rate Matching

Data Rate Matching combines sophisticated buffer management with HP's exclusive variable Adaptive Tape Speed technology, to allow the tape drive to match its transfer rate to the host speed dynamically and continuously across the wide range of transfer rates. This feature ensures that the tape drive continues to stream data regardless of the environment, and brings two big advantages:

- It optimizes backup performance and maximizes overall efficiency allowing the drive to respond immediately to any speed changes from the host
- It minimizes rewinding and repositioning of the tape, significantly reducing physical wear and increasing reliability
- It minimizes the power requirements for the drive by reducing the number of repositions needed

LTO Ultrium Tape Drive	ATS data transfer rate range (native)
HP LTO-6 Ultrium 6250	54 to 160 MB/s
HP LTO-5 Ultrium 3280/3000	47 to 140 MB/s
HP LTO-4 Ultrium 1840	40 to 120 MB/s
HP LTO-4 Ultrium 1760	35 to 80 MB/s
HP LTO-3 Ultrium 920	26 to 60 MB/s

HP Ultrium WORM

Critical to the success of data retention policies in highly regulated environments is the ability to store and manage data in an unalterable state. Following stringent guidelines set forth by regulatory

Product Highlights

agencies such as the SEC and HIPPA, IT organizations must now integrate new solutions and policies that can verify the integrity of stored data for periods that can extend well beyond seven years.

The LTO-6, LTO-5, LTO-4 Ultrium and LTO-3 Ultrium tape drives features the ability to archive and store data in a non-rewriteable format that meets the most stringent regulatory guidelines. Using a combination of integrated fail-safe features in the drive firmware, cartridge memory, and tape formatting, the tape drives can archive large amounts of data for periods of up to 30 years in a secure, untampered state. Since all LTO-6, LTO-5, LTO-4 and LTO-3 Ultrium tape drives include support for both rewritable and WORM media, IT organizations can now easily integrate a secure, long-term archiving solution into their current data protection strategy. As compared to other technologies that feature support for WORM storage, the tape drives offer the advantages of:

- A single drive to support all backup and archiving needs
- Two distinctive tape cartridges to easily distinguish and manage both rewriteable and WORM data cartridges
- A specially designed WORM data cartridge with multiple integrated fail-safe features to prevent accidental or intentional overwriting of data
- High-capacity, low-cost HP WORM media that can store up to 6.25 TB (2.5:1 compression) of data on a single data cartridge
- Support from many backup and archiving software vendors, providing the most comprehensive and mainstream support in the industry
- The LTO open standard that offers greater choice and compatibility across all third- and fourth-generation Ultrium products

NOTE: While all HP LTO-6, LTO-5, LTO-4, and LTO-3 Ultrium tape drives support LTO Ultrium WORM media, some LTO Ultrium tape drives from other manufacturers may not include read and write support for LTO Ultrium WORM media. For non-HP LTO Ultrium tape drives, please check the manufacturers' specifications to ensure this support is provided if you are using your WORM media. If WORM support is not provided, the drive will eject the WORM tape cartridge immediately upon insertion into the tape drive

Included backup and recovery software

The MSL2024 and MSL4048 tape libraries include the option to download Barracuda's (BN) Yosemite Server Backup Basic software free-of-charge. It is an easy-to-use backup and recovery application that is installed in minutes and includes all the features needed to protect a single machine by backup to a HP tape product. Yosemite Server Backup Basic software includes pre-defined and customizable media rotation schemes so you can define when you backup and how long your backups are retained, while easily managing your data cartridges. Using the included software you can easily backup a single Windows or Linux to a single drive MSL tape library.

NOTE: Yosemite Server Backup Basic comes with 30 days of free Maintenance and Support. After that time, customers have the option to upgrade to a retail version with Maintenance and Support

For more information please visit: www.barracudaware.com/ysbbasic

HP Data Protector software

HP Data Protector software automates high performance backup and recovery, from disk or tape, over unlimited distances, to enable 24x7 business continuity and improve IT resource utilization. Data Protector software responds to the pressure for lower IT costs and greater operational efficiency by offering acquisition and deployment costs which are 30 - 70 % less than competition. The license model is very simple and easy to understand, helping to reduce complexity. Extensive scalability and

Product Highlights

features for continuous backup and recovery operations enable growth with a single product. A superb solution, no other software can integrate better with the HP market-leading line of disk and tape family of products, as well as with other heterogeneous storage infrastructures. As an integral component of the fast-growing HP software portfolio, which includes storage resource management, archiving, replication, and device management software, Data Protector software also fully integrates with the HP management solutions, allowing managing data protection as an essential element of an overall IT service. This solution offers the unique advantage of being able to source hardware, software, and award winning service offerings from a single, trusted source.

Data Protector software simplifies the use of complex backup and recovery procedures with the fastest installation, automated routine tasks, and easy-to-use features. The centralized multi-site management easily allows implementing multi-site changes, adapting in real time to changing business requirements. Appropriate for medium and large companies in any industry, Data Protector software is the ideal solution to reduce IT costs and complexity while remaining reliable and scalable to grow from single server environments to the largest distributed enterprise infrastructures.

If you are using HP Data Protector software with your MSL8048 or MSL8096 tape library, a FREE 61-250 slot License-to-Use entitlement certificate is included in the box.

For further information, please visit our web page at: <http://www.hp.com/go/dataprotector>

Linear Tape File System (LTFS)

HP LTFS makes tape self-describing, file-based, and easy-to-use, it also provides users with the ability to use standard file operations on tape media for accessing, managing and sharing files with an interface that behaves just like a hard disk. In addition, LTFS provides the ability to share data across platforms, as you would with a USB drive or memory stick. Simply load a tape into the drive, mount it into the file system, and it becomes visible as a disk. For more information, including user guide, downloads and compatibility, visit: <http://www.hp.com/go/ltfs>

HP StoreOpen Automation

HP StoreOpen Automation is a free downloadable application that extends the LTFS capability to HP Autoloaders, HP MSL and ESL Tape Libraries. By simply mounting the tape autoloader or library as a file system, the intuitive HP StoreOpen Automation interface makes it easier to copy, rename, create or move files. When a cartridge folder is selected for use, that tape is automatically moved to an available tape drive.

When two drives are present, HP StoreOpen Automation supports tape-to-tape operations. HP StoreOpen Automation takes advantage of other standard HP Tape Library features including data encryption and HP TapeAssure.

For more information, including user guide, downloads and compatibility, visit: <http://www.hp.com/go/HPStoreOpen>

HP Library and Tape Tools

The MSL Tape Libraries are supported on HP's industry-leading diagnostic tool - HP Library and Tape Tools (L&TT). L&TT is a single, convenient program that is easy to install and simple to operate. L&TT's intuitive user interface eliminates the need for training and deploys in less than five minutes. This robust diagnostic tool is designed for both the experienced professional and the untrained administrator. It ensures product integrity through self-diagnostics and fast resolution to device concerns. Additional information on L&TT plus download information can be found at: <http://www.hp.com/support/tapetools>.

Product Highlights

HP Storage Media

HP recommends that you use HP-branded cartridges in the MSL Tape Libraries to assure the highest level of protection for your valuable data. The test program for HP media is the most thorough and comprehensive in the industry.

All HP cartridges must satisfy an exhaustive battery of additional tests that relate directly to real life situations, where real data and real businesses are at stake. The benefit of the HP brand specification for media is consistent quality. Through the testing of thousands of HP drives and HP cartridges, the ideal formulation for backup performance is defined and then continuously monitored. This hugely resource-intensive process is unique to HP and affords deep insight into the HP+HP backup solution for a wide range of environments and duty cycles. Your best choice for ease of support and maximum dependability is to use HP-branded Ultrium cartridges at all times. Correctly labeling your media will allow the library to quickly determine media and drive compatibility.

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Customization must comply with all relevant product specifications and factory supported configurations. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, and HP 9000 servers as well as MSA, VA7xxx, EVA, and XP disk arrays, rackable tape libraries and configurable network switches.

Type of service support varies by platform and product family. For more information on Factory Express services for your specific server model or storage device please contact your sales representative or go to: <http://www.hp.com/go/factory-express>.

Compatibility

HP's extensive compatibility testing program assures that your HP MSL Tape Libraries work with leading servers, operating systems, and backup applications - and not just those sold by HP. The MSL libraries work seamlessly in many environments, making them especially suitable if you have a mixed system environment. For the latest list of servers, workstations, operating systems, and backup software that support the MSL tape libraries, check the HP Data Agile BURA Compatibility Matrix (Formerly EBS) at: www.hp.com/go/BURACompatibility.

Server Compatibility

The MSL Tape Library is supported on a wide range of HP systems. For details of which MSL Libraries work with which systems, including third-party systems, reference the HP Data Agile BURA Compatibility Matrix (Formerly EBS) at: hp.com/go/BURACompatibility for the latest hardware compatibility information.

OS Support

Reference the HP Data Agile BURA Compatibility Matrix (Formerly EBS) for the most up-to-date OS compatibility information at: hp.com/go/BURACompatibility.

Software Support

Reference the HP Data Agile BURA Compatibility Matrix (Formerly EBS) for the most up-to-date software compatibility information at: hp.com/go/BURACompatibility.

Compatibility

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OS Support	Reference the HP Data Agile BURA Compatibility Matrix (Formerly EBS) for the most up-to-date OS compatibility information at: hp.com/go/BURACompatibility .
Software Support	Reference the HP Data Agile BURA Compatibility Matrix (Formerly EBS) for the most up-to-date software compatibility information at: hp.com/go/BURACompatibility .

Service and Support, HP Care Pack and Warranty Information

Warranty

MSL2024: The warranty for this product consists of 1-year parts exchange, next business day

MSL4048: The warranty for this product consists of 1-year parts exchange, next business day

NOTE: The HP MSL Tape Libraries warranty includes support for Customer Self Repair (CSR). The tape library cartridges, terminators, external cables, drives, magazines, controller board and power supplies are mandatory customer self repair parts. This means both the removal and replacement of the above parts are designed for easy replacement; the on-site warranty does not extend to these parts. However, customers may request HP Services to replace these replaceable units (RUs) for an additional charge. Also, customers who purchase an HP Support Agreement have the option to perform CSR or receive onsite support.

Please refer to HP's Limited Warranty Statement for further details:
<http://h18006.www1.hp.com/storage/warranty.html>

For increased uptime, productivity and ROI -HP Care Pack packaged services for Storage

These days, you need to get the most out of your storage investment-you can't afford not to. When you buy HP storage products and solutions, it's also a good time to think about what levels of service and support you may need. To help take the worry out of deploying, designing, maintaining, and managing your environment, we've designed a portfolio of service options that are as: flexible, reliable and scalable as your storage. Unlike storage-only vendors, we take a holistic approach to your entire environment, bridging storage, servers, blades, software and network infrastructures with our HP Care Pack packaged services for Storage.

Protect your business beyond the warranty

When it comes to robustness and reliability, standard warranties on today's computing equipment have matured just as the technologies have matured. Good news on some fronts-but also a source of potential problems and subsequent consequences that come from depending on standard warranties alone. Standard warranty protects against product defects and some causes of downtime- but not the business. By using a standard approach to warranty uplifts, such as HP Care Pack Services, you can reduce downtime risks and be more certain of operational consistency for both mission-critical and standard business computing. Simply put, HP Care Pack Services normalize the warranty of combined products - helping you proactively guard against unplanned downtime.

Extending warranties with HP Care Pack Services

For cost-effective upgrading or extending your standard warranty, HP Care Pack Services offer a suite of standard reactive hardware and software support services that are sold separately, or combined as with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition, with HP Proactive Select we offer an innovative approach to service delivery that gives you the flexibility to acquire the specific proactive services you need today, then add services as your needs evolve. HP Proactive Select offers a broad set of technical or per-event type service options - including server, storage, and network, SAN device, and software, environment, installation and education services. Services that you can mix and match depending on your specific requirements, from preliminary planning and equipment delivery to installation, configuration, integration, and testing, through every level of ongoing support. Our HP Care Pack packaged services for Storage assures help when you need it most. And for many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

Service and Support, HP Care Pack and Warranty Information

HP Storage Services: Offering reliability, flexibility and value—just like your storage

HP Storage Services offers a full spectrum of customer care, from technology support to complex migrations to complete completely managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education offers flexible, comprehensive training on storage networking, disk storage systems, and storage software to help your IT staff get the most out of your investments. And HP Financial solutions extend innovative financing and asset management programs to cost-effective buy, manage and eventually retire your older equipment.

HP Storage Services, the trusted business technology experts who manage your technology in action, because when technology works, business works. <http://www.hp.com/services/storage>

NOTE: Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at <http://www.hp.com/go/lookuptool>

Recommended Services HP Foundation Care 24x7 connects you to HP 24 hours a day, seven days a week for assistance on resolving issues - hardware onsite response within four hours and software call back within two hours after opening your case. Three years' coverage recommended with HP Care Pack Service.

HP ESL, MSL Tape Libraries Installation and Startup

Deployment of your HP Midrange Storage Library (MSL) products in SAN environments:.

- System installation and setup by an HP technical specialist
- Verification prior to installation that all service prerequisites are met
- Delivery of the service at a mutually scheduled convenient time
- Provides product installation according to the product specifications
- Offers deployment activities that are designed to bring the Fibre Channel-based tape library into operation
- Helps improve performance
- Makes the most of the value of the HP ESL, MSL, and EML libraries in an IT environment by leveraging HP knowledge in implementing Fibre Channel-based systems and solutions
- Helps reduce implementation-related disruptions in the IT environment
- Helps increase system reliability and provides more effective data management

<http://h20195.www2.hp.com/v2/GetPDF.aspx/5981-7355EN.pdf>

HP Backup and Recovery Solution Service

Rapid recovery from system downtime can hinge on the efficiency of your backup and recovery management environment - and on how well that environment is integrated with your storage infrastructure. But integration processes can be time-consuming and complex, and your IT resources are already stretched thin. Where can you find the expert help you need?

For fast, effective integration of your backup solution into an existing or new storage infrastructure,

Service and Support, HP Care Pack and Warranty Information

turn to the storage experts at HP Services. Our Backup and Recovery Solution Service (BRSS) provides end-to-end management of your backup integration process. The BRSS team works with you to analyze your business and IT environment; develop a comprehensive integration plan and timetable; design an architecture that suits your critical requirements; install backup software; implement your solution; and validate your configuration.

- By engaging HP to implement HP Data Protector, customers' IT staff can stay focused on their core tasks and priorities, resulting in less impact to your business
- Professional backup and recovery planning that aligns with customer's business needs and implementation that reduces project execution time and risk to the storage environment
- HP's expertise with backup and recovery helps ensure issues are avoided

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-7442EN.pdf>

Optional Services

5-Year HP Support Plus 24

As an alternative to our recommended support level, for customers who need to improve uptime with responsive 24x7 product support:

HP Support Plus 24 helps you increase performance and availability with comprehensive, consistent hardware and software services. Working with your IT team, HP Services engineers deliver onsite hardware support and over-the-phone software support around-the-clock 365 days per year. Service coverage encompasses HP products and selected multivendor hardware and software.

In addition, this convenient HP Care Pack packaged service makes software updates available to you at substantial savings.

Choose Support Plus 24 when you need to:

- Improve uptime with responsive hardware and software services available anytime
- Cost-effectively obtain expert 24x7 multivendor hardware and software support
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP and selected third-party software at a predictable cost
- Take advantage of subscription savings on software updates

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EN.pdf>

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals

Service and Support, HP Care Pack and Warranty Information

- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: <http://www.hp.com/support>

Customer Technical Training

Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online. www.hp.com/learn/storage

HP Services Awards

HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit: <http://h20219.www2.hp.com/services/cache/433028-0-0-225-121.htm>

Additional Services Information

For more information about HP Care Pack Services for Storage, please visit: <http://www.hp.com/services/storage>

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

Configuration Information

Step 1 - Select Base Library

HP StoreEver MSL Tape Libraries	Description	Part Number
	HP MSL2024 0-Drive Tape Library NOTE: Includes 24 slots, zero drives.	AK379A
	HP MSL4048 0-Drive Tape Library NOTE: Includes 48 slots, zero drives.	AK381A
	Kit Contents (for each library): <ul style="list-style-type: none"> One 2.5M PDU Power Cord, C13/C14, 10A (part number 142257-002) One RJ-45 Ethernet cable Rack-mount hardware Flyer for Yosemite Server Backup software* *NOTE: Yosemite Server Backup Basic comes with 30 days of free Maintenance and Support. After that time, customers have the option to upgrade to a retail version with Maintenance and Support	
Factory Racking	Factory integrate the MSL 2024 & 4048 Tape Libraries with other HP products such as HP ProLiant Servers NOTE: #0D1 will appear after the Tape Library part number on the sales order if HP factory integration is indicated	#0D1

Step 2 - Select Generation & Quantity of Ultrium Tape Drives

Select each option as required with quantities specified:

Tape Drives	HP StoreEver MSL LTO-6 Ultrium 6250 SAS Drive Upgrade Kit NOTE: Half height LTO-6 SAS tape drive. For use with the MSL 2024, 4048, 8048, 8096, or 6480 libraries. Drive kit includes a tape drive and documentation.	COH27A
	HP StoreEver MSL LTO-6 Ultrium 6250 FC Drive Upgrade Kit NOTE: Half height LTO-6 FC tape drive. For use with the MSL 2024, 4048, 8048, 8096 or 6480 libraries. Drive kit includes a tape drive and documentation.	COH28A
	HP StoreEver MSL LTO-5 Ultrium 3000 SAS Drive Upgrade Kit NOTE: Half height LTO-5 SAS tape drive. For use with the MSL 2024, 4048, 8048, 8096, or 6480 libraries. Drive kit includes a tape drive and documentation.	BL540B
	HP StoreEver MSL LTO-5 Ultrium 3000 Fibre Channel Drive Upgrade Kit NOTE: Half height LTO-5 FC tape drive. For use with the MSL 2024, 4048, 8048, 8096, or 6480 libraries. Drive kit includes a tape drive and documentation.	BL544B
	HP StoreEver MSL LTO-5 Ultrium 3280 Fibre Channel Drive Upgrade Kit NOTE: Full height LTO-5 FC tape drive. For use with the MSL 2024, 4048, 8048, 8096, or 6480 libraries. Drive kit includes a tape drive and documentation.	BL535B
	HP StoreEver MSL LTO-4 Ultrium 1760 SAS Drive Upgrade Kit NOTE: Half height LTO-4 SAS tape drive. For use with the MSL 2024, 4048, 8048, 8096, or 6480 libraries. Drive kit includes a tape drive and documentation.	AK383B

Configuration Information

Step 3 - Select Software Licenses

TapeAssure Advanced	HP StoreEver MSL TapeAssure Advanced LTU	TC406A
	Advanced analytics feature makes use of predictive analytics to predict the likelihood of failures, bottlenecks and load balancing issues in the tape infrastructure. It has unique capabilities of analytics around drive health and life as well as cartridge health and life. NOTE: One license needed per library and Command View TL must be installed. NOTE: This is a paper license that will be mailed	
	HP StoreEver MSL TapeAssure Advanced E-LTU	TC406AAE
	HP StoreEver TapeAssure Advanced Software provides advanced analytics for predictive analysis the likelihood of failures, bottlenecks and load balancing issues in the tape infrastructure. It has unique capabilities of analytics around drive health and life as well as cartridge health and life. NOTE: One license needed per library and Command View TL must be installed. NOTE: This is an electronically delivered License.	
Encryption Options/Licenses	HP 1/8 G2 Tape Autoloader and MSL Tape Library Encryption Kit	AM495A
	NOTE: For use with new or installed LTO-6, LTO-5 MSL2024/4048/8048/8096 or 6480 Tape Libraries. The Encryption Kit key server token will generate and retain encryption keys for HP LTO-6, LTO-5 Ultrium tape drives in the library. Does not require support from ISV.	
	HP StoreEver MSL2024/4048/8096 KMIP Encryption LTU	TC468A
	NOTE: For use with MSL2024/4048/8048/8096 Tape libraries using LTO-6, LTO-5 tape drives. The license will enable secure connectivity with supported KMIP 1.2 compliant key management servers. See the HP Data Agile BURA Compatibility Matrix (Formerly EBS) for the list of supported servers. (http://www.hp.com/go/BURCompatibility). NOTE: This license will be delivered via hard copy in the mail.	
	HP StoreEver MSL2024/4048/8096 KMIP Encryption E-LTU	TC468AAE
	NOTE: For use with MSL2024/4048/8048/8096 Tape libraries using LTO-6, LTO-5 tape drives. The license will enable secure connectivity with supported KMIP 1.2 compliant key management servers. See the HP Data Agile BURA Compatibility Matrix (Formerly EBS) for the list of supported servers. (http://www.hp.com/go/BURCompatibility) NOTE: This license will be delivered electronically.	

Configuration Information

Step 4 - Select Additional Accessories

Regional Power Cords **NOTE:** One PDU power cord is shipped per library. IF not using the included PDU cord mentioned above (part number 142257-002) please select the correct power cord for your geographical location below.

Cords	Quantity	Description	Part Number
	1 each	HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord	AF556A
	1 each	HP C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord	AF568A
	1 each	HP C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord	AF570A
	1 each	HP C13 - DK-2.5A DK 250V 10Amp 1.83m Power Cord	AF566A
	1 each	HP C13 - SEV 1011 CH 250V 10Amp 1.83m Power Cord	AF565A
	1 each	HP C13 - CEI-23-50 IT/CL 250V 10Amp 1.83m Power Cord	AF571A
	1 each	HP C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord	AF567A
	1 each	HP C13 - CNS-690 TW 110V 13Amp 1.83m Power Cord	AF561A
	1 each	HP C13 - GB-1002 CN 250V 10Amp 1.83m Power Cord	AF557A
	1 each	HP C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	AF572A
	1 each	HP C13 - AS3112-3 AU 250V 10Amp 2.5m Power Cord	AF569A
	1 each	HP C13 - IRAM -2073 AR 250V 10A 2.5m Power Cord	AF558A
	1 each	HP C13 - Nema 5-15P TH/PH 250V 10Amp 1.83m Power Cord	AF559A
	1 each	HP C13 - KSC- 8305 KR 250V 10Amp 1.83m Power Cord	AF560A
	1 each	HP C13 - SI-32 IL 250V 10Amp 1.83m Power Cord	AF564A
	1 each	HP C13 - IS-1293 IN 240V 6Amp LV 2.0m Power Cord	AF562A

WARNING: This product can ONLY be used with an HP approved power cord for your specific geographic region. Use of a non-HP approved power cord may result in: 1) not meeting individual country specific safety requirements; 2) insufficient conductor ampacity that could result in overheating with potential personal injury and/or property damage; and 3) an unapproved power cord could fracture resulting in the internal contacts being exposed, which potentially could subject the user to a shock hazard. HP disclaims all liability in the event a non-HP approved power cord is used.

For a complete list of power cord options, please see: www.hp.com/products/powercords

Related Options

Redundant Power Supply Upgrade Kit	HP MSL Redundant Power Supply Upgrade Kit	AH220A
	NOTE: For use in the MSL4048, 8048 or 8096 Tape Libraries to add a second customer-installable power supply into the unit. HP MSL Redundant Power Supply ships with PDU power cord (C13/C14, 10A, P/N 142257-002). If a user wishes to connect to HP MSL Redundant Power Supply to 110V US wall outlet power then the US Power Cord (P/N AF556A) must be ordered separately. If customers require a power cord, they can check the power cord matrix for the appropriate cord. Please see the UPS and PDU cable matrix's on the Power Protection page under Power Cords that lists cable descriptions, requirements, and specifications for UPS and PDU units at the new HP Power Cord Link @ HP.com. Use the following new link: www.hp.com/products/powercords	
Magazine Kits	HP MSL2024 Ultrium Left Magazine Kit	AG119A
	NOTE: For use in the MSL 2024tape Libraries in either the upper or lower left position. User-enabled mail slots can be configured at either 0 or 3 slots.	
	HP MSL Ultrium Left Magazine Kit	AG330A
	NOTE: For use in the MSL 4048, 8048, or 8096 tape Libraries in either the upper or lower left position. When used in the lower left position, user-enabled mail slots can be configured at either 0 or 3 slots.	
Rack Cabinets	HP MSL Ultrium Right Magazine Kit	AG120A
	NOTE: For use only on the right side of the MSL 2024, 4048, 8048, or 8096 Tape Libraries; additional 12-slot magazine for either the right upper or lower position.	
	The MSL libraries are supported in a variety of HP Rack offerings, including the HP Intelligent Series Racks and the HP 10000 G2 Series Racks. For more information on the HP rack offerings, please see the following URL: www.hp.com/go/rackandpower	
	NOTE: The MSL Tape Libraries are certified to ship in HP racks which include a shock pallet. It is mandatory to use a shock pallet in order to ship racks with equipment installed.	
Media	HP LTO-6 Ultrium 6.25TB MP RW Data Cartridge	C7976A
	HP LTO-6 Ultrium 6.25TB BaFe RW Data Cartridge	C7976B
	HP LTO-6 Ultrium 6.25TB MP WORM Data Cartridge	C7976W
	HP LTO-6 Ultrium 6.25TB BaFe WORM Data Cartridge	C7976BW
	HP LTO-5 Ultrium 3TB RW Data Cartridge	C7975A
	HP LTO-5 Ultrium 3TB WORM Data Cartridge	C7975W
	HP LTO4 Ultrium 1.6TB Read/Write Data Cartridge	C7974A
	HP LTO4 Ultrium 1.6TB WORM Data Tape Cartridge	C7974W
	HP LTO-3 Ultrium 800 GB Re-writable Data Cartridge	C7973A
	HP LTO-3 Ultrium 800 GB WORM Data Cartridge	C7973W
	HP LTO-2 Ultrium 400GB Data Cartridge	C7972A
	HP Ultrium Universal Cleaning Cartridge	C7978A
Bar Code Labels		

Related Options

HP LTO-6 Ultrium RW Bar Code Label Pack	Q2013A
HP LTO-5 Ultrium RW Bar Code Label Pack	Q2011A
HP LTO-5 Ultrium WORM Bar Code Label Pack	Q2012A
HP LTO-4 Ultrium Read/Write Bar Code Label Pack	Q2009A
HP LTO-4 Ultrium WORM Bar Code Label Pack	Q2010A
HP Ultrium 3 RW Bar Code Label Pack	Q2007A
HP Ultrium 3 WORM Bar Code Label Pack	Q2008A
HP Ultrium 2 Bar Code Label Pack	Q2002A

Non-Custom Labeled Data Cartridges

NOTE: Non-Custom labels will come pre-labeled with a pre-determined number sequence.

HP LTO-6 Ultrium 6.25TB MP RW Non Custom Labeled Data Cartridge 20 Pack	C7976AN
HP LTO-6 Ultrium 6.25TB BaFe RW Non Custom Labeled Data Cartridges 20 Pack	C7976BN
HP LTO-5 Ultrium Non-custom Labeled Data Cartridge 20 Pack	C7975AN
HP LTO-4 Ultrium 1.6TB Non-custom Label Data Cartridge 20 Pack	C7974AN
HP Ultrium 800GB Non-custom Label 20 Pack	C7973AN
HP Ultrium 400GB Non-custom Label 20 Pack	C7972AN
HP Ultrium 200GB Non-custom Label 20 Pack	C7971AN

Custom Labeled Data Cartridges

NOTE: Custom labeled products allow customers to customize a specific sequence printed on each label.

HP LTO-6 Ultrium 6.25TB MP RW Custom Labeled Data Cartridge 20 Pack	C7976AL
HP LTO-6 Ultrium 6.25TB MP RW Custom Labeled Data Cartridge No Case 20 Pack	C7976AC
HP LTO-6 Ultrium 6.25TB MP RFID RW Custom Labeled Data Cartridge 20 Pack	C7976AF
HP LTO-5 RW Custom Labeled Data Cartridge 20 Pack	C7975AL
HP LTO-5 RW Custom Labeled No Case Data Cartridge 20 Pack	C7975AC
HP LTO-5 WORM Custom Labeled Cartridge 20 Pack	C7975WL
HP LTO-4 Ultrium 1.6TB RW Custom Label Data Cartridge 20 Pack	C7974AL
HP LTO-4 Ultrium 1.6TB WORM Custom Label Data Cartridge 20 Pack	C7974WL
HP LTO-3 Ultrium 800GB RW Labeled Data Cartridge 20 Pack	C7973AL
HP LTO-3 Ultrium 800GB WORM Labeled Data Cartridge 20 Pack	C7973WL
HP LTO-2 Ultrium 400GB Pre-labeled Data Cartridge 20 Pack	C7972AL
HP Ultrium 200 GB pre-label Data Cartrdg 20 Pk.	C7971AL

NOTE: For more information on LTO media, see: <http://h18006.www1.hp.com/storage/storagemedia.html?psn=storage>

FC Host Bus Adapters

The MSL Libraries are certified with a number of Fibre Channel Host Bus Adapters. For the most current list of supported FC HBAs, please see the HP Storage HP Data Agile BUR A Compatibility Matrix (Formerly EBS) and Design Guide located at: <http://www.hp.com/go/BUR Acompatibility>.

For more information on FC HBAs, see Fibre Channel Host Bus Adapters at: <http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>.

SAS Host Bus Adapters

The MSL Libraries are certified with a number of ProLiant SAS Host Bus Adapters and Smart Array

Related Options

Controllers. For the most current list of supported devices, please see the HP Data Agile BURA Compatibility Matrix (Formerly EBS) and Design Guide located at:

<http://www.hp.com/go/BURACompatibility>.

For more information on HP Smart Array RAID controllers, see Fibre HP Smart Array RAID controllers at:

<http://h18004.www1.hp.com/products/servers/proliantstorage/arraycontrollers/index.html>.

For more information on HP ProLiant (SAS) host bus adapters, see:

<http://h18004.www1.hp.com/products/servers/proliantstorage/adapters/index.html>.

SCSI Host Bus Adapters

The MSL Libraries are certified with a number of SCSI Host Bus Adapters. For the most current list of supported devices, please see the HP Data Agile BURA Compatibility Matrix (Formerly EBS) and Design Guide located at: <http://www.hp.com/go/BURACompatibility>.

For more information on HP ProLiant (SCSI) host bus adapters, see:

<http://h18004.www1.hp.com/products/servers/proliantstorage/adapters/index.html>.

HBAs/Controllers for Tape Automation Connect

HBA/ Controller Product Number

HP H241 12Gb 2-ports Ext Smart Host Bus Adapter NOTE: Recommended for ProLiant Gen9 SAS tape automation connect.	726911-B21
HP H221 PCIe 3.0 SAS HBA NOTE: Recommended for ProLiant Gen8 SAS tape automation connect	729552-B21
HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller NOTE: Recommended for ProLiant Gen8 SAS tape automation connect.	631667-B21
HP Smart Array P421/1GB FBWC 6Gb 2-ports Ext SAS Controller NOTE: Recommended for ProLiant Gen8 SAS tape automation connect.	631673-B21
HP Smart Array P421/2GB FBWC 6Gb 2-ports Ext SAS Controller NOTE: Recommended for ProLiant Gen8 SAS tape automation connect.	631674-B21
HP Smart Array P721m/512 FBWC 6Gb 4-ports Ext Mezzanine SAS Controller NOTE: Recommended for Gen8 C series blade enclosure tape automation connect.	655636-B21
HP Smart Array P721m/2GB FBWC 6Gb 4-ports Ext Mezzanine SAS Controller NOTE: Recommended for Gen8 C series blade enclosure tape automation connect	650072-B21
HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller NOTE: Recommended for ProLiant G6/G7 SAS tape automation connect. 256MB or larger write cache recommended for more than two tape drives.	462828-B21
HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller NOTE: Recommended for ProLiant G6/G7 SAS tape automation connect.	462834-B21
HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller NOTE: Recommended for ProLiant G6/G7 SAS tape automation connect.	462830-B21
HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller NOTE: Recommended for ProLiant G6/G7 SAS tape automation connect.	462832-B21
HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller NOTE: Recommended for C series blade enclosure tape automation connect.	513778-B21
HP Smart Array P712m/256 6Gb 2-ports Int/2-ports Ext Mezzanine SAS Controller NOTE: Recommended for C series blade enclosure tape automation connect.	488348-B21
HP Smart Array P700m/256 4-ports Ext PCIe x8 SAS Controller	

Related Options

SCSI HBA

HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller

HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter

412911-B21

NOTE: Single channel PCI-Express (PCI-e) SCSI Ultra 320 HBA.

Optical cables

OM4 LC-LC type cables

HP Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable

QK732A

HP Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable

QK733A

HP Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable

QK734A

HP Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable

QK735A

HP Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable

QK736A

HP Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable

QK737A

Allowed cable lengths:

External Cable type	Drive type	2Gb	4Gb	8Gb
OM2	All drive types	0.5m - 300m	0.5m - 150m	NA
OM3/OM4	All except LTO-5 Ultrium 3000	0.5m - 500m	0.5m - 380m	0.5m - 150m
OM3/OM4	LTO-5 Ultrium 3000	0.5m - 300m	0.5m - 150m	0.5m - 50m

NOTE: The HP MSL LTO-5 Ultrium 3000 Drive contains an internal OM2 optical cable and limits the maximum allowed cable lengths to those as specified for OM2. The lowest OM rating in a path from the drive to the switch or HBA will dictate the maximum length of the connection path.

Cable Kits (SCSI, SAS)

HP 2.5m VHDS68/HDTS68 M/M Multi SCSI Cable

C2362B

HP 5m VHDS68/HDTS68 M/M Multi SCSI Cable

C2365B

HP 2m External Mini SAS High Density to Mini SAS Cable

716191-B21

NOTE: One cable is required for every tape drive. Use this cable to connect HP MSL SAS Tape Libraries to the HP H241 Smart Host Bus Adapter.

HP 4m External Mini SAS High Density to Mini SAS (SFF8644 to SFF8088) Cable

716193-B21

NOTE: One cable is required for every tape drive. Use this cable to connect HP MSL SAS Tape Libraries to the HP H241 Smart Host Bus Adapter

HP 2M SAS Min-Min 1xCable Assembly Kit

AE470A

NOTE: One SAS autoloader only. Use this cable to connect HP SAS external tape devices to HP SAS controllers with external Mini-SAS (SFF8088) connectors.

HP 4M SAS Min-Min 1x Cable Assembly Kit

AE465A

NOTE: One SAS autoloader only. Use this cable to connect HP SAS external tape devices to HP SAS controllers with external Mini-SAS (SFF8088) connectors.

HP 2m External Mini-SAS to 4x1 Mini-SAS Cable

AN975A

NOTE: One cable is required for every four autoloaders or every four library drives. Use this cable to connect HP MSL SAS Tape Libraries to Mini-SAS (SFF8088) ports.

HP 4m External Mini-SAS to 4x1 Mini-SAS Cable

AN976A

NOTE: One cable is required for every four autoloaders or every four library drives. Use this cable to connect HP MSL SAS Tape Libraries to Mini-SAS (SFF8088) ports.

HP External SAS to mini-SAS Fanout Cable

AH587A

NOTE: One cable is required for every four drives. Use this cable to connect HP MSL SAS Tape Libraries to HP SAS controllers with Infiniband (SFF8470) connectors.

Related Options

HP Care Pack Options	Same Day Response	
	HP 3 year 4 hour 24x7 MSL 2024 Hardware Support	UE296E
	HP 3 year 4 hour 9x5 MSL 2024 Hardware Support	UG635E
	HP 3 year 4 hour 24x7 MSL4048 Library Hardware Support	UD835E
	HP 3 year 4 hour 9x5 MSL 4048 Library Hardware Support	UE940E
	Next Business Day Response	
	HP 3 year Next business day MSL 2024 Hardware Support	UE294E
	HP 3 year Next business day MSL4048 Library Hardware Support	UD833E
	NOTE: In order to maximize ROI and product uptime, and minimize the cost of ownership, Hewlett-Packard recommends the 3-year, 24 x 7 service options. These offerings will ensure that any product issue can be tackled when they occur (most back up issues will occur outside standard business hours) and that the service coverage regarding period, covers the minimum expected life of the host system.	

Technical Specifications

		MSL2024	MSL4048
Drive Technology		LTO-6 Ultrium 6250 LTO-5 Ultrium 3280 LTO-5 Ultrium 3000 LTO-4 Ultrium 1840 LTO-4 Ultrium 1760	LTO-6 Ultrium 6250 LTO-5 Ultrium 3280 LTO-5 Ultrium 3000 LTO-4 Ultrium 1840 LTO-4 Ultrium 1760
Maximum Number of Drives		1 (Ultrium 3280, 1840) 2 (Ultrium 6250, 3000, 1760)	2 (Ultrium 3280, 1840) 4 (Ultrium 6250, 3000, 1760)
Number of Slots		24	48
Drive Interface		8 Gb Native Fibre Channel 4 Gb Native Fibre Channel 6 Gb/sec SAS 3 Gb/sec SAS	8 Gb Native Fibre Channel 4 Gb Native Fibre Channel 6 Gb/sec SAS 3 Gb/sec SAS
Maximum Capacity	Native	60 TB (LTO-6) 36 TB (LTO-5) 19.2 TB (LTO-4)	120 TB (LTO-6) 72 TB (LTO-5) 38.4 TB (LTO-4)
	Compressed (2.5:1)	150 TB (LTO-6)	300 TB (LTO-6)
	Compressed (2:1)	72 TB (LTO-5) 38.4 TB (LTO-4)	144 TB (LTO-5) 76.8 TB (LTO-4)
Maximum Transfer Rate	Native	1.15 TB/hr (two 6250) 504 GB/hr (one 3280) 1.0 TB/hr (two 3000) 432 GB/hr (one 1840) 576 GB/hr (two 1760)	2.3 TB/hr (four 6250) 1.0TB/hr (two 3280) 2.0 TB/hr (four 3000) 864 GB/hr (two 1840) 1.1 TB /hr (four 1760)
	Compressed (2.5:1)	2.88 TB/hr (two 6250)	5.76TB/hr (four 6250)
	Compressed (2:1)	1 TB/hr (one 3280) 2 TB/hr (two 3000) 864 GB/hr (one 1840) 1.1TB/hr (two 1760)	2.0 TB/hr (two 3280) 4.0 TB/hr (four 3000) 1.7 TB/hr (two 1840) 2.3 TB/hr (four 1760)
		*For more information about the MSL6480 please visit www.hp.com/go/msl6480	

		MSL2024	MSL4048
Dimensions	Out-of-Box (HxWxD)	3.4 x 18.9 x 31.7 in (8.7 x 48 x 80.6 cm)	6.9 x 18.9 x 31.7 in (17.5 x 48 x 80.6 cm)
	Shipping (HxWxD)	10.7 x 23.2 x 38.9 in (27.1 x 58.9 x 98.7 cm)	13.7 x 23.2 x 38.9 in (34.8 x 58.9 x 98.7 cm)
Weight	Out of box	32.9 lb (14.9 kg)	47.2 lbs (21.4 kg)
	Shipping	56.9 lb (25.8 kg)	74.7 lbs (33.9 kg)
		Note: The weight of each library varies somewhat based on the type and number of LTO tape drives contained in the configuration. The weights shown here are for MSL2024/4048 configurations with 1/2 drives respectively per model. Configurations with different numbers of tape drives can be calculated by adding or subtracting the weight of a tape drive. An LTO-6 Ultrium 6250 drive weighs 2.10 kg/4.63 lbs.	
Reliability	MSBF (mean swaps)	2 Million robot load/unload cycles	

Technical Specifications

	between failures)		
	MTBF (mean time between failures)	100,000 hours (based on 1M MSBF)	
Average Cartridge Swap Time (drive to slot, slot to drive)		45 seconds	45 seconds
Initialization Time		80 to 120 seconds	
Inventory Time		1:20 minutes (using bar code labeled cartridges)	2:15 minutes (using bar code labeled cartridges)
Average Cartridge Swap Time in Extended Libraries (drive to slot, slot to drive)	Extended Library Configuration	Average Swap Time	
	2024/4048	100 seconds	
	4048/4048	98 seconds	
	2024/8096	110 seconds	
	4048/8096	110 seconds	
	NOTE: Two MSL2024s or two MSL8096s are not supported configurations MSL8048 must have all 96 slots enabled prior to using the Library Extender. Once all 96 slots have been enabled for use, the supported configurations are the same as 8096s.		
Connectors	Mini-SAS (MSL SAS model only)- 68-pin HDTS (MSL SCSI models only) LC Optical Fibre (MSL FC models only) (1)RJ-45 Ethernet (1) USB port		
LED Indicators (on front panel)		Ready LED (Green): shows ready status information Clean LED (Amber): shows fault status information Attention LED (Amber): shows fault status information Error LED (Amber): shows fault status information	
Management Interface		10/100 Mbytes/second, auto-configuring interface. RJ-45 connection. Https configurable.	
Power		MSL2024: 168 Watts (max) MSL4048: : 312 Watts (max)	
Input Requirements		100 to 240 VAC, 50 to 60 Hz, 2.5 Amperes	
Relative Humidity (non-condensing)	Operating	20% to 80%	
	Shipping	20% to 90%	
Temperature Range (wet bulb)	Operating	50° to 95° F (10° to 35° C)	
	Shipping	-22° to 140° F (-30° to 60° C)	
	NOTE: Library operating temperature limits are based on the industry standard tape limit.		
Altitude	Operating	13,000 ft (4000 m)	
	Shipping	35,000 ft (10,675 m)	

Summary of Changes

Date	Version History	Action	Description of Change:
30-Jan-2015	From Version 43 to 44	Changed	Removed skus that are going EOL. Updated naming on a few skus. Changes made to the Related Options, Config Info, Product Highlights and Overview Sections.
31-Oct-2014	From Version 42 to 43	Changed	Changes made throughout the QuickSpecs.
09-May-2014	From Version 41 to 42	Changed	Recommended Services was revised.
31-Jan-2014	From Version 39 to 41	Added	MSL Library Extender was added to Related Options
02-Dec-2013	From Version 38 to 39	Changed	Edits were mostly to reflect the removal of the LTO-3 Ultrium 920 and the MSL8048 and MSL8096 and to add the MSL6480 throughout.
30-Sep-2013	From Version 37 to 38	Changed	Product descriptions were revised in Configuration and Related Options.
22-Mar-2013	From Version 36 to 37	Added	Added StoreEver throughout entire QS Compatibility: Added Compatibility section to section. Related Options: Added HBAs/Controllers for Tape Automation Connect section.
		Removed	Product Highlights: Removed Ease of Use with LTFS and HP StoreOpen section
		Changed	Overview: Updated product description and key features sections Product Highlights: Updated TapeAssure, Included backup and recovery software sections. Service and Support, HP CarePack and Warranty Information: Updated Warranty section Configuration Information: Updated all section in Step 1 and first section in Step 2 Related Options: Updated Optical cables, Cable Kits (SCSI,SAS), Rack Cabinets and Media sections. Technical Specification: Updated Chart sections Maximum Capacity, Average Cartridge Swap Time in Extended Libraries (drive to slot, slot to drive) and Connectors sections.
18-Jan-2013	From Version 34 to 35	Changed	Changes were made in the following sections: Configuration Information: Step 1/HP StoreEver MSL4048 Tape Library Related Options: Encryption, Table Top Conversion Kit, Media
21-Dec-2012	From Version 33 to 34	Changed	Changes were made in the following sections:

Summary of Changes

			Overview: Family Comparison
			Related Options: Optical Cables
04-Dec-2012	From Version 32 to 33	Changed	Changes were made throughout the QuickSpec.
12-Oct-2012	From Version 31 to 32	Changed	Change made to URL in Service and Support, HP Care Pack, and Warranty Information section.
24-Sep-2012	From Version 30 to 31	Changed	Changes made throughout the QuickSpec.
07-Sep-2012	From Version 29 to 30	Changed	Changes made to the North America and Canada versions.
17-Aug-2012	From Version 28 to 29	Changed	Changes made to the Related Options section.
10-Aug-2012	From Version 26 to 28	Changed	Changes made to Product Highlights and Related Options.
22-Jun-2012	From Version 25 to 26	Changed	Changes made to Product Highlights and Related Options.
06-Apr-2012	From Version 24 to 25	Changed	FC Host Bus Adapters were added to Related Options HP MSL4048 2 LTO-4 Ultrium 1840 and 1760 and 1 LTO-3 Ultrium 920 SCSI Tape Libraries were removed from HP MSL4048 Tape Library HP U320e SCSI Host Bus Adapter was removed from SCSI Host Bus Adapters
16-Mar-2012	From Version 23 to 24	Removed	Mentions of LTO-3 Ultrium 960 and PremierFlex OM3+ LC/LC type cables and OM2 LC-LC type cables were removed.
10-Feb-2012	From Version 22 to 23	Added	Added HP Smart Array P711m and HP Smart Array P712m adapters to the options section.
13-Jan-2012	From Version 21 to 22	Changed	HP StoreOpen Automation was revised.
30-Sep-2011	From Version 20 to 21	Added	Linear Tape File System (LTFS) and HP StoreOpen Automation were added to Product Highlights.
02-Sep-2011	From Version 19 to 20	Changed	Drive interface was updated in the Family Comparison chart Optical cables were revised in Related Options Connectors was completely revised in Technical Specifications
08-Jul-2011	From Version 18 to 19	Changed	Revisions were made in Configuration Information and to Redundant Power Supply Upgrade Kit in Related Options.
17-Jun-2011	From Version 16 to 18	Changed	OM3 LC-LC type cables were revised and 2m SW LC/SC FC Cable Kit was removed from OM2 LC-LC type cables in Optical Cables.
08-Jun-2011	From Version 15 to 16	Removed	Removed StorageWorks throughout the document.
27-Sep-2010	From Version 14 to 15	Changed	Family Comparison chart was revised Software in the Box was changed to Included backup and recovery software in Product Highlights Tape Libraries were completely revised and mentions of HP Data Protector Express Basic backup and recovery software was added throughout Step 1 Easy and economical upgrade of the included software to Data Protector Express was added to Product Highlights

Summary of Changes

			<p>Optical Cables were added to Related Options</p> <p>Upgrade included software to Data Protector Express was added to Related Options</p> <p>Customer Benefits was removed from the Overview</p> <p>2m, 5m and 15m SW LC/SC FC Cable Kits were removed from Cable Kits</p> <p>5642 (42U) Rack Cabinet was removed from Rack Cabinets</p>
21-Jun-2010	From Version 13 to 14	Changed	<p>Revisions were made throughout the Overview and Product Highlights sections</p> <p>Service and Support, HP Care Pack, and Warranty Information was completely revised</p> <p>HP LTO-5 Ultrium RW Bar Code Labels and WORM Bar Code Labels were added and Storage Media Kits were removed from Media</p> <p>All mentions of LTO-5 Ultrium 3000 was added</p>
29-Mar-2010	From Version 12 to 13	Changed	<p>LTO-5 Ultrium 3280 Tape Drives were added throughout the QuickSpec, TapeAssure was added to Product Highlights and Documentation kit including User and Service Guide (CD) and Getting Started Poster was removed throughout Step 1 of the Configuration Information.</p>
15-Jan-2010	From Version 11 to 12	Changed	<p>NOTE for HP StorageWorks MSL2024 Ultrium Left Magazine Kit was revised in Magazine Kits.</p>
11-Dec-2009	From Version 10 to 11	Changed	<p>PDU Power Cords was revised in Step 2 of the Configuration Information section.</p>
25-Nov-2009	From Version 9 to 10	Changed	<p>SAS and SCSI Host Bus Adapters and Controller/HBA and Cable Recommendation Matrix were modified in Related Options and Native Maximum Transfer Rate was revised for LTO-4 Ultrium 1760 in the Technical Specifications section.</p>
09-Oct-2009	From Version 8 to 9	Removed	<p>Removed part number AH219A from Step 1 of Configuration Information.</p>
24-Sep-2009	From Version 7 to 8	Added	<p>Added part numbers AK379A & AK381A to step 1 of the Configuration Information section.</p>
		Removed	<p>Removed part number AH219A from the Recommended Services section.</p>
14-Sep-2009	From Version 6 to 7	Added	<p>MLS8048 Tape Library throughout the QuickSpec</p> <p>Slot license upgrade to the Product Highlights and Related Options sections</p> <p>StorageWorks to Model descriptions throughout the Configuration Information and Related Options sections</p>

Summary of Changes

		Changed	The title has changed.
29-Jul-2009	From Version 5 to 6	Added	Added pointers to the Library Extender and Data Encryption sections in Product Highlights.
08-Jul-2009	From Version 4 to 5	Changed	Corrected two part numbers in the Related Options section.
19-Jun-2009	From Version 3 to 4	Added	<p>Software in the Box to the Product Highlights section</p> <p>HP Data Protector Express Software CD to HP StorageWorks MSL2024 and MSL 4048 Tape Libraries in Step 1 of the Configuration Information section</p> <p>HP MSL2024/4048/8096 LTO-4 Ultrium 1760 SCSI Drive Upgrade Kit and HP MSL 2024/4048/8096 LTO-2 Ultrium 448 SCSI Drive Upgrade Kit to Tape Drives in the Related Options section</p> <p>2m SFF8088-to-SFF8088 1x SAS Cable Kit and 4m SFF8088-to-SFF8088 1x SAS Cable Kit to Cable Kits in the Related Options section</p> <p>Controller/HBA & Cable Recommendation Matrix to the Related Options section</p>
		Changed	<p>Updated NOTES for HP SC44Ge SAS Host Bus Adapter in Host Bus Adapters and throughout Cable Kits in the Related Options section</p> <p>Revised LTO-2 Ultrium 448 Drive Technology for MSL2024 in the Technical Specifications section</p>
12-May-2009	From Version 2 to 3	Changed	The title has changed.
23-Apr-2009	From Version 1 to 2	Changed	Changes made within the Family Comparison, Product Highlights, Related Options and Technical Specifications.

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For tape drives and media, 1 GB = 1 billion bytes. Actual formatted capacity is less.